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I. ROCKETS AND ARTIFICIAL EARTH SATELLITES

Use of Parachutes for Re-Entry

The following is the text of an article on the return of a human by parachute.

"In our country [USSR] a great deal of research work has been done on returning living animals from space. In one instance the animals were in hermetically sealed compartments in the forward part of a rocket. At a height of 200-100 kilometers it [the compartment] was detached from the vehicle and fell freely down to 4 kilometers, at which point the parachute system went into action. In another instance, the animals were in compartments which were not hermetically sealed, and their descent to the Earth was provided by individual parachutes. At an altitude of 85 km, a carriage containing a dog in a pressure suit and parachute was catapulted from the nose of a rocket. Within 3 seconds, the parachute was opened by a semiautomatic device, and the dog, in the pressure suit and carriage, was lowered to the Earth from a height of 82 km.

"Sometimes the vehicle with the dog was released at a height of 35-50 km and fell in free flight to a height of 4 km, where the parachute opened semiautomatically. The nose of the rocket was lowered to Earth by its own parachute.

"Experience has shown the dependability of the parachute system and the real possibility of manned flight in a rocket to great heights with safe return to Earth. Only the parachute has the property of being compact in form, small in volume, and capable of being opened at the top with a large surface area with sufficient resistance to provide a safe rate of descent.

"To determine the conditions for a safe return to Earth, let us examine the flight of a man in the nose of a rocket. Let us assume that the rocket reaches an altitude of 100 km. Here the nose of the rocket is detached and falls freely down to a height of 4 km, where the parachute system goes into action automatically. The rate of descent of the capsule to the Earth by parachute is 6-7 meters per second, which is admissible for the human organism.

"Up until the time of the opening of the parachute the capsule falls at random, because at great altitudes its aerodynamic stabilizing devices are not effective. For this reason, the human has to be securely fastened to a seat.

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"In the altitude range of 100 to 35 km, the fall of the nose accelerates, because of the low density of the air, and the nose descends to 65 km in 116 seconds; in the region of 35-38 km the rate of fall decreases rapidly. As a result of the deceleration, in the course of 10-12 seconds, a G-stress of 4.4-5.3 will be exerted on the human located inside the nose. To decrease its magnitude and to guarantee an early assigned direction, it is necessary to use a stabilizing parachute at high altitudes, which will prevent an increase of speed of the nose, and prevent its tumbling.

"The human organism can withstand considerably larger G-stresses, but only for short periods of time. Thus, for example in the opening of the parachute at a speed of about 500 kilometers per hour, the pilot is exposed to an 18- to 20-fold G-stress in the course of 0.1 second.

"When forces are exerted in the back-to-chest direction, the human can withstand a tenfold G-stress for 20 seconds. By placing a seat appropriately in the nose of the rocket or by stabilizing the nose in such a way that the G-stress produced during the take-off and deceleration of the rocket will be exerted in the back-to-chest direction, it is possible to guarantee the safe flight and descent of a human.

"In the altitude range of 5-3 km, where the rate of descent of the nose drops to 200-250 meters per second, it is possible to use a parachute system.

"G-stresses exerted during the opening of the parachute at low altitude and during the landing of the nose with its parachute are low in value, short-lived, and not dangerous. To increase safety, the man may also have an individual emergency parachute.

"The possibility of abandoning the rocket, just as with any flying apparatus, is limited by the value of the air impact pressure. Under modern conditions, a safe catapulting of the pilot without the use of protective equipment such as the pressure suit and capsule is possible, if the impact pressure does not exceed 4,000-5,000 kilograms per square meter.

"During the free fall of the nose of the rocket from an altitude of 100 kilometers, the maximum impact pressure at an altitude of 21 kilometers does not exceed 2,600 kg/m^2. For this reason, it is possible to catapult from any altitude. When the rocket falls freely without the nose being detached, the possibility of catapulting is somewhat limited, inasmuch as the impact pressure of the rocket falling from a height of 100 km reaches 11,500 kg/m^2 at an altitude of 9.5 km. As shown by calculations, catapulting is possible, under such conditions, only at altitudes above 20 km or below 3 km.

"With protective devices (pressure suit, etc.), catapulting is possible at an impact pressure of up to 7,000 kg/m^2, i.e., at altitudes above 15.5 km or below 5 km.

"Besides the limitations on catapulting, there are also conditions which place limitations on the opening of the emergency parachute. It is well known that at great heights, where the air density is almost zero, the canopy of the parachute cannot be filled [with air], and [the parachute] might not even open without the use of special devices.

"With these limitations in mind, let us consider at what altitudes it is possible to open an emergency parachute. It will be filled with air if the canopy and shroud lines are pulled out to their full length and if the system load-parachute moves with sufficient speed to create the impact pressure. Thus, for example, the emergency parachute of the pilot, extended to its full length, is able to start filling up with air at an impact pressure of 0.1-0.5 kg/m^2. To guarantee such a pressure, for example at a height of 90 km, the rate of descent must be 710-1,500 meters per second.

"Successful tests on recovered animals have shown that with an immediate release of the parachute after the capsule has been catapulated into free flight at an altitude of 100 km, the canopy of the parachute begins to fill up with air at an altitude of 85 km.

"On the basis of these conditions, the emergency parachute can be used at an altitude of less than 85 km right after catapulting. However, because of the considerable load exerted on the canopy at certain altitudes, it is not difficult to conclude that it is impossible to open the emergency parachute in the altitude range of 55 to 3 kilometers. Thus, for example at an altitude of 48 km, the canopy is subjected to a pressure of 4,000 kg, (which may cause a shroud line to break or the canopy to burst) and 70,000 kg at 24 km.

"During the opening of the emergency parachute in the altitude range of 85-58 km, the rate of descent of the seat containing the man does not exceed 900 meters per second. During this descent, the temperatures of friction produced during the period of 25-30 seconds will not destroy the fabric of the parachute.

"Consequently, allowing for the limitations, it is possible to use an emergency parachute in the altitude range of 85-58 km, and below 3 km.

"After a long delay (man and capsule-seat in free fall after catapulting), the parachute can be opened at a height of less than 6.5 kilometers, if the rate of descent does not exceed 100 meters per second. Above this altitude the rate of descent is so great that it is impossible to open the parachute. For a man plus his parachute (100 kilograms in

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weight) the critical rate of descent near the Earth is about 70 meters per second, but at an altitude of 12 kilometers it is about 140 meters per second. To guarantee a relatively stable descent, a stabilizing parachute, 1.5-2 m^2 in size, can be used, which goes into action at any altitude where catapulting is safe, i.e., in 100- to 20-km range or below 3 km.

"The necessity of a long free fall of the man together with his cockpit seat from a great height, with a delay of the opening of the main parachute until an altitude of 4 km is reached, has been confirmed by a number of findings. The free fall should be made together with the cockpit seat, because an oxygen supply, instruments and various devices required by the man during his descent are easy to place in it. After being catapulted out of the nose of the rocket, for example at an altitude of 85 km, he will take only 197-200 seconds to fall to an altitude of 4 km, before the main parachute is opened, whereas he will descend for 1,755 seconds, with 500 seconds taken up by tumbling and swaying, after the main parachute is opened.

"In the low-temperature zone, the region of oxygen deficiency and low partial pressures, one eighth the amount of oxygen is required during the 200-second descent as compared with the descent after the opening of an emergency parachute.

"The possibility of a free descent for 197-200 seconds has been confirmed in practice.

"Experiences of successful returns of animals from altitudes of up to 200 km made in the USSR in the period 1950-1957 permit the assumption that a safe descent of a human to the Earth from an altitude of 100 km may be safely provided with the aid of a parachute system in the nose of a rocket and individual emergency parachutes." ("The Parachute -- a Means of Returning Man to Earth From Cosmic Flight," by N. A. Lobanov; Moscow, Vestnik Vozdushnogo Flota, No 7, Jul 58, pp 44-46)

Soviet Moon Shot in 1959 Reported by French News Source

For several years, probably since 1955, the Soviets have had a calendar for the conquest of the Moon set up.

In an interview granted to the journal France-USSR, Professor Khlebtsevich has revealed the following information about the Soviet plan of which he is the author:

1. In 1959, probably, launching of an Earth-guided rocket which would crash on the Moon. The weight of the rocket would be about 50 tons.

2. Launching of a rocket carrying a caterpillar tractor which would land on the Moon and send back television pictures. For this, a five-stage rocket would be needed weighing, theoretically, 50 tons. The first four stages would refuel, in flight, a fifth which would land on the Moon to unload the tractor.

3. Finally, the launching of a manned scientific station.

Professor Khlebtsevich did not give exact details on the dates of the last two items on the Soviet calendar. ("Soviet Try at Moon: 1959"; Paris, Paris-Journal, 13 Oct 58, p 6)

Ionospheric Absorption of Radio Waves From Sputnik I and II

Radio transmitters with frequencies of 20 and 40 megacycles were placed in Sputniks I and II for conducting investigations of the ionosphere. Observations were conducted by comparator and direction finding points and by numerous radio amateurs. One of the methods used in processing the results of the observations is described in an article which appeared in a recent issue of Radiotekhnika i Elektronika.

The article describes a method for determining the absorption coefficient of radio waves in the ionosphere by measuring electric field intensity. By comparing the integral absorption coefficient at various altitudes of the satellite with respect to the maximum of electron concentration in the F2 layer, the radio-wave absorption was determined over the whole thickness of the F2 layer, as well as for the layers below.

To measure the field intensity from the satellite-borne transmitters, radio-comparator stations of the Ministry of communications USSR located at various points in the Soviet Union were utilized. These stations were equipped with type VINP and TME-18 automatic-recording field intensity meters. The Moscow and Khabarovsk comparator points processed the data. The data from Sputnik I for 5, 6, and 7 October 1957 and data from Sputnik II for 3, 7, and 8 November 1957 were carefully analyzed. In this analysis three separate ranges were studied: the range of direct visibility, the middle-distance range, and the great-distance range (6,000-8,000 kilometers).

Preliminary investigation has shown that integral absorption in the F2 layer as determined from the experiment agreed well with theoretical calculations. For great distances, i.e., from 6,000 kilometers, the actual field intensity exceeded the calculated values for conditions of ideal propagation. This points to the fact that for great distances the electromagnetic propagation was along ionospheric radioducts. Under these conditions, the signals from the satellite could be heard as far as 16,000 kilometers. ("Absorption of Radio Waves in the Ionosphere According to Radio Observations of Artificial Earth Satellites," by A. N. Kazantsev, T. S. Romanova, and A. Ya. Klementenko; Moscow, Radiotekhnika i Elektronika, Vol III, No 9, Sep 58, pp 1107-1121)

II. UPPER ATMOSPHERE

Effects of Auroras on the Ionosphere and on the Earth's Geomagnetic and Geoelectrical Fields Registered at Ashkhabad

Auroras were observed at Ashkhabad on 4 and 29 September 1957, an occurrence rather rare for these low latitudes and an indication of their great intensity. It is known that auroras are caused by the penetration of corpuscular streams from the Sun penetrating the upper layers of the Earth's atmosphere and that they are accompanied by changes in the ionosphere and the Earth's geomagnetic and geoelectric fields.

The 4 September aurora was observed in Ashkhabad (visually) from 2230 to 2315 hours, with a maximum at 2245 hours. The 29 September aurora was more intense and, according to the data of the Astrophotometric Laboratory, it began at 2035 hours, achieved a maximum at 2130 hours, and ended at 2300 hours (Moscow time).

Five hours before the beginning of the 4 September aurora and 8 hours before the beginning of the 29 September aurora at 1459:02 and 0215 Moscow time, respectively, the sudden beginning of the magnetic storms and the disturbances in the Earth currents were registered simultaneously at the "Vannovskaya" geophysical station.

The auroras of 4 and 29 September were observed during the most active periods of the geomagnetic disturbances. The amplitudes of the variations of the horizontal components of the geomagnetic field reached γ 320 on 4 September and γ 380 on 29 September. The amplitude of the variations of the N-S and E-W components of the field of Earth currents during the most active periods observed on 4 and 29 September were, respectively, 205 millivolts per kilometer and more than 270 millivolts per kilometer. The geomagnetic and geoelectric storm began somewhat later, and, exactly at 2200 hours on 4 September and at 2000 hours on 29 September, the "Ashkhabad" ionosphere station noted the beginning of the ionospheric disturbances. The ionospheric disturbance of 4 September continued for 13 hours with a maximum from 0200 to 0600 hours and was characterized by a lowering of the critical frequency of up to 52 percent (zone time).

The 29 September ionospheric storm was characterized by the sudden beginning ($+\Delta f^{o}F2 = 29\%$ in 20 hours) and by a continuous diffusion in all frequency ranges from 1.5 to 9.0 megacycles, which is an indication of the deep penetration of the corpuscular particles into the ionosphere.

It should particularly be mentioned that short periodic pulse-type disturbances, rare in regard to both their nature and intensity, were registered during the auroras on the high-speed apparatus recording Earth currents. Short periodic pulse-type fluctuations are distinguished from other rather frequently encountered types of short periodic geoelectrical disturbances by the small period (1-3 seconds) and by the true synosidal form of the oscillations and their pulsating nature.

The 4 September pulse-type short periodic oscillations began at 1928 hours and reached a maximum intensity at 1933-1936 hours, and during this time had a period of 2.5-2.6 seconds. The maximum amplitudes of the North and East components were equal to 2.2-2.9 millivolts per kilometer and 3.8-4.4 millivolts per kilometer, respectively. The oscillations with a gradually attenuating amplitude continued up to 0400 on 5 September.

The 29 September oscillations with this same period began suddenly at 1859:20 hours and reached a maximum intensity at 2019-2025 hours. During this time the North and East components were equal to 3.6-4.4 millivolts per kilometer. The oscillations subsequently rapidly faded and ended at 2230 hours.

Two illustrations are given. Figure 1 shows the diurnal variations of $f^{o}F2$ from their values during the calm state of the ionosphere during 3, 4, 5 and 28, 29, and 30 September 1957. Figure 2 shows the high-frequency characteristics for 29 September at 2130 hours. ("Condition of the Ionosphere, the Geomagnetic Field, and Earth Currents During Auroras, Registered at Ashkhabad on 4 and 29 September 1957," by Ye. K. Dubrovskaya and V. G. Dubrovskiy, Institute of Physics and Geophysics, Academy of Sciences Turkmen SSR; Ashkhabad, Izvestiya Akademii Nauk Turkmenskoy SSR, No 4, 1958, pp 104-105)

Pulkovo Astronomer Reports Volcanic Activity on Moon

A Pravda article states that volcanic activity on the Moon has been established by N. A. Kozyrev, Doctor of Physicomathematical Sciences, a Pulkovo astronomer who has just returned from the Crimean Astronomical Observatory, where he made astronomical observations on the largest reflector (50 inches) telescope in the USSR.

In an interview Dr Kozyrev revealed some details of the discovery.

Up to the present the Moon has been considered a dead celestial body in which any internal processes are nonexistent. Nowhere in literature can any mention of volcanic activity on the Moon be found. It is true, said Dr Kozyrev, that last year the American astronomer Alter obtained photographs of the Moon at the Mount Wilson Observatory, California, which gave certain indications concerning the possibility of emanating gases veiling the interior details of the crater of Alphonsus.

This circumstance, said Kozyrev, gave him the idea of investigating the crater of Alphonsus by the spectral method. Conditions for operations are extremely favorable in Crimea, where there is a powerful telescope. During 3 weeks of observations, about 20 photographs of the crater of Alphonsus were successfully made. An unusual photograph of the central peak of the crater was obtained on 3 November about 1600 hours Moscow time. The peak appeared reddish and greatly weakened in the violet rays. After 1800 hours on this same date, the brightness of the peak increased almost double in intensity for about 30 minutes. At the same time, bright lines of carbon and its compounds appeared in the spectrum of the peak. Thereafter, the phenomenon ended. Subsequent photographs fixed the usual state of the crater.

"There is basis for considering," concluded Dr Kozyrev, "that the observed phenomenon represents the normal development of a volcanic process on the surface of the Moon."

A. A. Mikhaylov, Corresponding Member of the Academy of Sciences USSR and chairman of the academy's Astronomical Council, was approached later for a comment on Kozyrev's discovery. Mikhaylov said that the observations are of great interest, in particular for cosmogony and astronautics. Preliminary consideration of the spectrograms obtained by Kozyrev indicate that there is no doubt as to the occurrence of a volcanic eruption on the Moon. The existing point of view concerning the origin of the basic features of the Moon's relief as a result of the impact of meteorites can now be considered completely incorrect. The volcanic eruption indicates that the Moon possesses, as does the Earth, innate orogenic processes creating relief. ("Eruption of a Volcano on the Moon"; Moscow, Pravda, 13 Nov 58)

Czechoslovak Spectrograph Described

The spectrograph at the observatory in Ondrejov is winning fame for the observatory and for Czech scientists. Scientific workers are busy at this seemingly simple machine from morning to night. The mirrors cast an image of the Sun with its spots on a wall. During the IGY, 35 observatories in the world are observing solar eruptions. The greatest number has been observed by the German observatory on the Isle of Capri. The second-largest number has been observed by the Ondrejov observatory.

The greatest treasure of the Ondrejov observatory -- the new solar spectrograph -- is hidden behind white doors marked "Entrance Forbidden." Previous spectrographs were able to photograph either the entire spectrum, which was too small for study, or only a very small part of the spectrum. Several workers of the Ondrejov observatory, headed by Dr Svestek and Dr Kopecky, succeeded in constructing an instrument with which it is possible to photograph several parts of the solar spectrum.

A thin ray of sunlight penetrates a darkened room. It is reflected by a system of mirrors and falls on an interference grid (interferencni mrizka), which is a gift from the Lomonosov University in Moscow and is worth almost one million crowns. There are 600 fine, sharp lines per millimeter on the grid. The grid radiates a rainbow, 5 meters long, which is caught by five cameras. ("Semi-Bulator [proper name] Was Wrong," by Vera Petrova; Prague, Zapisnik 58, 25 Jul 58, p 13)

III. OCEANOGRAPHY

Improved Underwater TV Apparatus

A model of an improved underwater television apparatus which has a transmitting camera having circular scanning has been built in the Laboratory of Marine Electronics of the Institute of Oceanology, Academy of Sciences USSR.

Water currents from the cruising ship and the twisting of the cable make it extremely difficult to change the direction of a transmitting camera, while at more or less great depths, at the desire of the observer. The new model is equipped with a circular scanning mechanism making it possible to change the transmitting camera's direction from a general control panel.

The frame of the turning mechanism is equipped with a small stabilizing fin ensuring its immobility when the camera is turned.

A feature of the design is that one coupling rod of the turning mechanism is used for turning the transmitting camera in two mutually perpendicular planes. This makes it possible to use only one stuffing box, a desirable feature since any stuffing box in deepwater instruments is a weak spot.

A crank gear is used to turn the camera in a vertical plane. Two electric motors are used to drive the mechanisms.

The system is arranged so that the motors can operate either singly or in unison. In the latter case the camera will view along a spiral line.

Block contacts in the electrical system limit the horizontal turning angle to 330 degrees. This angle can be slightly increased by repositioning the contacts. The angle of the field of view of the camera's objective in water is equal to 30 degrees, which with the 330-degree rotation of the camera on the horizontal plane is sufficient to obtain a 360-degree field of view.

The camera's limited turning angle is necessary to prevent twisting the cable leading from the frame of the turning mechanism to the transmitting camera.

Block contacts are also used for the motors controlling the vertical sweep of the camera.

The camera is so designed that its vertical sweep is $\pm$ 55 degrees from the horizontal plane. Consequently for ensuring a field of view over an entire sphere an objective with an angle of view in water equal to 70 degrees is necessary. Testing showed that the camera's turn in the horizontal plane takes 0.5 minute, and in the vertical plane, about 1.5 minutes.

Standard TV receivers are used in the new apparatus. To do this, V. I. Marakuyev developed a transmitting camera in whose circuit he introduced a modulator and a UHF low-power oscillator. The camera sends a somewhat simplified signal to the surface on the carrier frequency usual in TV receivers. A shortcoming of such a system is the inevitable complication of the transmitting camera circuit.

The use of a cable-hawser is also a feature of the new device. ("Improved Underwater Television Apparatus," by N. V. Vershinskiy; Moscow, Byulleten' Tekhniko-Ekonomicheskoy Informatsii, No 8, Aug 58, pp 57-58)

IV. ARCTIC AND ANTARCTIC

Drift Station Severnyy Polyus-6

In the early days of November, the drift station Severnyy Polyus-6 was located in the central, "near-polar" area of the Arctic Ocean. Since April 1958, the station has traveled from 80 degrees N latitude and crossed the 85th parallel, drifting to the northwest from the 150th to the 112th meridian E longitude and covering over 700 kilometers.

During the first half of September, the air temperature was often as low as minus 24 degrees centigrade. Heavy snowfalls and frequent purgas caused drifts 1.5 meters high in the station area. The present air temperature is minus 30-35 degrees centigrade.

According to observations of oceanologist Tarasov and previously collected materials, the eastern slope of the submarine Lomonosov Range is more gradual. Observations show that the number of thermic and mechanical cracks forming on the surface of the floating ice island have increased over the number in previous years. Bryazgin and Pyatnenkov, actinometrists, have obtained new data on the extent and nature of the subsnow and subglacial radiation. Systematic observations of this type were made for the first time in high northern latitudes and they are of considerable scientific interest. The aerologists have completed the solar cycle of ozonometric observations. Now they are preparing to conduct similar work during the polar night. For this purpose the Main Geophysical Observatory in Leningrad is building a special universal installation. All these activities are being conducted outside the IGY program. They are a contribution of the polar scientists of Severnyy Polyus-6 on the occasion of the 41st anniversary of the October Revolution and the forthcoming 21st Congress of the CPSU. ("On A Drifting Ice Floe," by S. Serlapov, chief of Drift station Severnyy Polyus-6; Moscow, Vodnyy Transport, 4 Nov 58)

End of Polar Night in Antarctic

After the long polar night, the Sun finally rose over the south geomagnetic pole. The reappearance of the Sun at different Soviet antarctic stations occurred at different times, according to their coordinates. The Sun first appeared on 15 July over the station Pionerskaya; then, in August, over Komsomol'skaya; 10 days later at Sovetskaya; and finally, during the past few days [i.e., the last days of August] at Vostok.

The rising of the Sun was accompanied by severe magnetic storms, together with frequent auroras. During the daytime, an absorption of radio waves took place in the ionosphere, causing a disturbance of radio communications. The temperature at Vostok is still below minus 80 degrees centigrade. Recently, a temperature of minus 87 degrees centigrade was registered. ("Sun Over Antarctica," by V. Chernov; Leningrad, Leningradskaya Pravda, 2 Sep 58)

Transantarctic Flight Yields Scientific Data

Soviet explorers have made a number of flights over Antarctica and have determined the elevations of various parts of the continent. As is known, the South Pole is at an elevation of 2,800 meters above sea level. It is considerably lower than the icecap on which the Soviet stations Komsomol'skaya, Vostok, and Sovetskaya are located. No information was previously available as to the nature of the slope descending from the top of the icecap, especially from the station Sovetskaya situated at an elevation of 3,560 meters, in the direction of the South Pole. It was unknown whether there were any icefalls or crevasses in this area.

The recent transantarctic flight was planned in order to find the answers to all these questions. With the help of careful, special observations it was necessary to determine the profile of the antarctic ice sheet, extending over a great distance from Mirnyy to the South Pole. This was done by the Soviet scientists. In addition, they determined the profile of the region between the US station McMurdo and the Pravda Coast on their return flight.

Each member of the transantarctic flight had a set of instruments in front of him on board the plane. Instrument readings were taken every 5 minutes, or sometimes more often, thus making it possible to obtain elevation figures for the observed points. During the flight of the IL-12, all Soviet stations conducted radiosonde tests of the upper atmosphere. These data will enable scientists to construct a spatial baric field along the length of the route, to which the observation data can be "tied in."

The long flight demanded great exertion of effort on the part of everyone concerned. During many hours, the plane was at an altitude of 4,000-4,500 meters above sea level and oxygen masks had to be used. In the area of the south geographic pole there was a frosty haze, through which the antarctic Sun was faintly visible. When the plane arrived over the South Pole, it dropped to a lower altitude. One could distinguish the station buildings and people waving to the plane. To the left of the IL-12 course was the South Pole, marked by a high steel mast with a flag.

The scientific materials collected during the flight are now being processed in Mirnyy. ("Our Plane Flies Over the South Pole," by V. Bugayev, Candidate of Geographical Sciences, chief of aerometeorological detachment, Third Antarctic Expedition; Moscow, Vodnyy Transport, 4 Nov 58)

Polish IGY Expedition to Spitsbergen

Prof Alexander Kosiba and Dr Stanislaw Siedlecki are in Norway after heading a 36-member expedition to Spitsbergen as a part of the Polish IGY program.

Ten members of the expedition spent last winter in Spitsbergen, investigating, among other things, glacier ice thickness and radioactivity in the atmosphere.

A new, somewhat smaller, Polish expedition to Spitsbergen is being planned, according to Professor Kosiba. ("Glaciers on Spitsbergen Becoming Larger -- Colder in Norway"; Oslo, Aftenposten, AM edition, 12 Sep 58, p 9)

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